


Moderate Carbohydrate Diet Extends Longevity by Four Years, says Lancet Study

Aug. 22nd, 2018

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Low or moderate carbohydrate intake, which is better for overall health? For the past decade, Americans have touted the benefits of a low-carbohydrate diet, among them the Atkins, Paleo and Ketogenic. While shunning highly processed carbohydrates is always recommended, strict adherence to these diets also snubbed certain complex carbohydrates such as fruits, vegetables, legumes and whole grains, in favor of meat and dairy proteins. A recently released observational study in *Lancet Public Health Journal* suggests that such diets may shorten one's life span by up to four years. The researchers conclude that eating carbohydrates in moderation seems to be optimal for health and longevity.

At the heart, pardon the pun, of this study is heart disease. This study of more than 15,400 people was from the Atherosclerosis Risk in Communities Study (ARIC) in the USA. The epidemiologic study, ARIC, was conducted in four U.S. communities and is designed to investigate the etiology and natural history of atherosclerosis, the etiology of clinical atherosclerotic diseases, and variation in cardiovascular risk factors, medical care and disease by race, gender, location, and date.

This particular study found that diets both low (< 40% energy) and high (>70% energy) in carbohydrates were linked with an increase in mortality, while moderate consumers of carbohydrates (50-55% of energy) had the lowest risk of mortality. Though there is no conclusive cause and effect outcome, the observations in this study say moderate carbohydrate diets may add another four years to one's life.

These findings bring together several strands that have been controversial. Too much and too little carbohydrate can be harmful but what counts most is the type of fat, protein, and carbohydrate,”

~ Walter Willett, Professor of Epidemiology and Nutrition at Harvard T. H. Chan School of Public Health and co-author of the study.

The primary findings, confirmed in a meta-analysis of studies on carbohydrate intake including more than 432,000 people from over 20 countries, also suggest that not all low-carbohydrate diets appear equal – eating more animal-based proteins and fats from foods like beef, lamb, pork, chicken and cheese instead of



carbohydrate was associated with a greater risk of mortality. Alternatively, eating more plant-based proteins and fats from foods such as vegetables, legumes, and nuts was linked to lower mortality.

We need to look really carefully at what are the healthy compounds in diets that provide protection,” says Dr Sara Seidelmann, Clinical and Research Fellow in Cardiovascular Medicine from Brigham and Women’s Hospital, Boston, USA who led the research.

Moderate Carbohydrate Study Findings

During a median follow-up of 25 years there were 6283 deaths in the ARIC cohort, and there were 40,181 deaths across all cohort studies. In the ARIC cohort, after multivariable adjustment, there was a U-shaped association between the percentage of energy consumed from carbohydrate (mean 48.9%, SD 9.4) and mortality: a percentage of 50–55% energy from carbohydrate was associated with the lowest risk of mortality.

In the meta-analysis of all cohorts (432,179 participants), both low carbohydrate consumption (<40%) and high carbohydrate consumption (>70%) conferred greater mortality risk than did moderate intake, which was consistent with a U-shaped association (pooled hazard ratio 1.20, 95% CI 1.09–1.32 for low carbohydrate consumption; 1.23, 1.11–1.36 for high carbohydrate consumption).

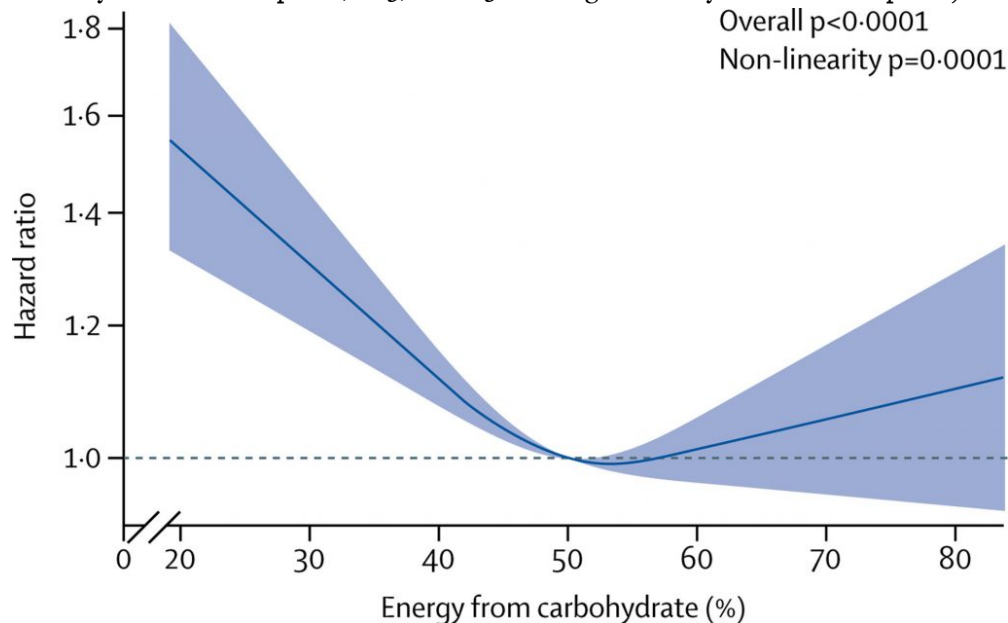


Figure 1U-shaped association between percentage of energy from carbohydrate and all-cause mortality in the ARIC cohort The reference level is 50% energy from carbohydrate. Results are adjusted for age, sex, race, ARIC test centre, total energy consumption, diabetes, cigarette smoking, physical activity, income level, and education. ARIC=Atherosclerosis Risk in Communities.

However, results varied by the source of macronutrients: mortality increased when carbohydrates were exchanged for animal-derived fat or protein (1.18, 1.08–

1.29) and mortality decreased when the substitutions were plant-based (0.82, 0.78–0.87).

Low-carb diets that replace carbohydrates with protein or fat are gaining widespread popularity as a health and weight loss strategy. However, our data suggests that animal-based low carbohydrate diets, which are prevalent in North America and Europe, might be associated with shorter overall life span and should be discouraged. Instead, if one chooses to follow a low carbohydrate diet, then exchanging carbohydrates for more plant-based fats and proteins might actually promote healthy aging in the long term.” ~ Dr Sara Seidelmann

Long-Term Impact of Moderate Carbohydrate vs High Carb and Protein Diets

Previous randomized trials have shown low carbohydrate diets are beneficial for short-term weight loss and improve cardiometabolic risk. However, the long-term impact of carbohydrate restriction on mortality is controversial with prospective research so far producing conflicting results. What’s more, earlier studies have not addressed the source or quality of proteins and fats consumed in low-carb diets.

To address this uncertainty, researchers began by studying 15,428 adults aged 45–64 years from diverse socioeconomic backgrounds from four US communities (Forsyth County, NC; Jackson, MS; Minneapolis, MN; and Washington County, MD) enrolled in the ARIC cohort between 1987 and 1989. All participants reported consuming 600–4200 kcal per day for men and 500–3600 kcal per day for women, and participants with extreme (high or low) caloric intake were excluded from the analysis.

At the start of the study and again 6 years later, participants completed a dietary questionnaire on the types of food and beverages they consumed, what portion size and how often, which the researchers used to estimate the cumulative average of calories they derived from carbohydrates, fats, and protein.

The researchers assessed the association between overall carbohydrate intake (categorized by quantiles) and all cause-mortality after adjusting for age, sex, race, total energy intake, education, exercise, income level, smoking, and diabetes. During a median follow-up of 25 years, 6283 people died.

Results showed a U-shape association between overall carbohydrate intake and life expectancy, with low (less than 40% of calories from carbohydrates) and high (more than 70%) intake of carbohydrates associated with a higher risk of mortality compared with moderate intake (50–55% of calories).

The researchers estimated that from age 50, the average life expectancy was an additional 33 years for those with moderate carbohydrate intake – 4 years longer than those with very low carbohydrate consumption (29 years), and 1 year longer compared to those with high carbohydrate consumption (32 years).

However, the authors highlight that since diets were only measured at the start of the trial and 6 years later, dietary patterns could change over 25 years, which might make the reported effect of carbohydrate consumption on lifespan less certain.

In the next step of the study, the authors performed a meta-analysis of data from eight prospective cohorts (including ARIC) involving data from 432,179 people in North American, European, and Asian countries. This revealed similar trends, with participants whose overall diets were high and low in carbohydrates having a shorter life expectancy than those with moderate consumption.

As Seidelmann explains, “A midrange of carbohydrate intake might be considered moderate in North America and Europe where average consumption is about 50% but low in other regions, such as Asia, where the average diet consists of over 60% carbohydrates.”

In further analyses examining whether the source of proteins and fats favored in low-carbohydrate diets – plant-based or animal-based – was associated with length of life, researchers found that replacing carbohydrates with protein and fat from animal sources was associated with a higher risk of mortality than moderate carbohydrate intake. In contrast, replacing carbohydrates with plant-based foods was linked to a lower risk of mortality (see table 3 in the full access study below).

The findings show observational associations rather than cause and effect. Considering evidence from other studies, the authors speculate that Western-type diets that heavily restrict carbohydrates often result in lower intake of vegetables, fruit, and grains and lead to greater consumption of animal proteins and fats – some of which have been implicated in stimulating inflammatory pathways, biological aging, and oxidative stress – and could be a contributing factor to the increased risk of mortality. Whilst high carbohydrate diets (common in Asian and less economically advantaged nations) tend to be high in refined carbohydrates such as white rice, may also contribute to a chronically high glycemic load and worse metabolic outcomes.

Commentary

In a commentary, Dr Andrew Mente and Dr Salim Yusuf from McMaster University, Hamilton, Canada said, “Such differences in risk associated with extreme differences in intake of a nutrient are plausible, but observational

studies cannot completely exclude residual confounders when the apparent differences are so modest. Based on first principles, a U-shaped association is logical between most essential nutrients versus health outcomes. Essential nutrients should be consumed above a minimal level to avoid deficiency and below a maximal level to avoid toxicity. This approach maintains physiological processes and health (ie, a so-called sweet spot). Although carbohydrates are technically not an essential nutrient (unlike protein and fats), a certain amount is probably required to meet short-term energy demands during physical activity and to maintain fat and protein intakes within their respective sweet spots. On the basis of these principles, moderate intake of carbohydrate (eg, roughly 50% of energy) is likely to be more appropriate for the general population than are very low or very high intakes.”

Mente and Yusuf go on to say: “The findings of the meta-analysis should be interpreted with caution, given that so-called group thinking can lead to biases in what is published from observational studies, and the use of analytical approaches to produce findings that fit in with current thinking. The ideal approach to meta-analysis would be a collaboration involving investigators of all the large studies ever done (including those that remain unpublished) that have collected data about carbohydrate intake and clinical events, and pool the individual data using transparent methods. This approach is likely to provide the best and most unbiased summary of the effects of carbohydrates on health, rather than reliance on the results of any single study.” See link to full commentary at the end of this article.

Study Discussion

“This work provides the most comprehensive study of carbohydrate intake that has been done to date, and helps us better understand the relationship between the specific components of diet and long term health,” says Dr Scott Solomon, The Edward D Frohlich Distinguished Chair at Brigham and Women’s Hospital and Professor of Medicine at Harvard Medical School, and senior author on the paper. “While a randomized trial has not been performed to compare the longer term effects of different types of low carbohydrate diets, these data suggest that shifting towards a more plant-based consumption is likely to help attenuate major morbid disease.”

The authors note some limitations including that dietary patterns were based on self-reported data, which might not accurately represent participants’ food consumption; and that their conclusions about animal-based sources of fat and protein might have less generalized relevance to Asian populations which tend to have diets high in carbohydrates, but often consume fish rather than meat. Finally, given the relatively small number of individuals following plant-based low-carb diets, further research is needed.

[Click Here for Full Text Study](#)

[Click Here for Commentary, Evolving Evidence About Diet and Health. The authors say “meta-analysis like these should be interpreted with caution.”](#)

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